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10/575,565	05/07/2007	Zeev Zalevsky	ZALEVSKY=5	1383
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EXAMINER				
JONES, JAMES				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/575,565

Applicant(s)

ZALEVSKY ET AL.

Examiner

JAMES C. JONES

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-90 is/are pending in the application.
- 4a) Of the above claim(s) 73-81, 89 and 90 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 71 is/are allowed.
- 6) ☒ Claim(s) 1, 3-5, 8, 1, 11, 17, 35-40, 43, 47, 65, 67, 68, 72, 82 and 84-86 is/are rejected.
- 7) ☒ Claim(s) 2, 6, 7, 9, 12-16, 18-34, 41, 42, 44-46, 48-64, 66-70, 83, 87 and 88 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 5/7/2007 & 4/1/2010
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-72 and 82-88 in the reply filed on 3/26/2010 is acknowledged.
2. Claims 73-81, 89 and 90 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 3/26/2010.

Information Disclosure Statement

3. The information disclosure statements (IDS) submitted on 5/7/2007 and 4/1/2010 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements have been considered by the examiner.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "10" found on pg. 14, line 9 of the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Wilson (4995693) hereafter Wilson.

Wilson discloses the limitations therein including the following:

Regarding claim 1 Wilson discloses an optical system configured to provide a desired illuminating light pattern, the system comprising a light source system (40)

configured and operable to produce structured light in the form of a plurality of spatially separated light beams (col. 4, lines 12); and a beam shaping arrangement (46 and 62 as the "beam shaping arrangement"); the beam shaping arrangement being configured as a diffractive optical unit (col. 4, line 49) configured and operable to carry out at least one of the following: (i) combining an array of the spatially separated light beams into a single light beam thereby significantly increasing intensity of the illuminating light (shown in fig. 2) (ii) affecting intensity profile of the light beam to provide the illuminating light of a substantially rectangular uniform intensity profile.

8. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Noguchi (4701005) hereafter Noguchi.

Noguchi discloses the limitations therein including the following:

Regarding claim 1, Noguchi discloses an optical system configured to provide a desired illuminating light pattern, the system comprising a light source system (abstract, lines 1-2) configured and operable to produce structured light in the form of a plurality of spatially separated light beams (shown in fig. 4, note its shown in figure 4 that the light beams are spatially separated); and a beam shaping arrangement (H); the beam shaping arrangement being configured as a diffractive optical unit (col. 2, lines 20-22)) configured and operable to carry out at least one of the following: (i) combining an array of the spatially separated light beams into a single light beam thereby significantly increasing intensity of the illuminating light (col. 2, lines 2-7) (ii) affecting intensity profile of the light beam to provide the illuminating light of a substantially rectangular uniform

intensity profile.

Claims 1, 3-5, 8, 10, 11, 17, 35-40, 43, 47, 65, 67, 68, 72, 82, and 84-86 are rejected under 35 U.S.C. 102(e) as being anticipated by Kapellner et al (20060279662) hereafter Kapellner.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Kapellner discloses the limitations therein including the following:

Regarding claims 1, 72 and 82, Kapellner discloses an optical system configured to provide a desired illuminating light pattern, the system comprising a light source system (902) configured and operable to produce structured light in the form of a plurality of spatially separated light beams (fig. 9, depicts that the light beams are spatially separated); and a beam shaping arrangement (914A-914C); the beam shaping arrangement being configured as a diffractive optical unit (par. [0096], line 11) configured and operable to carry out at least one of the following: (i) combining an array of the spatially separated light beams into a single light beam thereby significantly increasing intensity of the illuminating light; (ii) affecting intensity profile of the light beam to provide the illuminating light of a substantially rectangular uniform intensity profile (par. [0108], lines 9-10).

Regarding claims 3 and 84, Kapellner discloses the system of claim 1(ii), wherein said diffractive optical unit comprises a tophat element assembly (par. [0096], line 11).

Regarding claims 4 and 85, Kapellner discloses the system of claim 3, wherein said tophat element assembly comprises an array of tophat elements (914A-914C) arranged in accordance with an array of the spatially separated light beams (902A-902C), such that each of the tophat elements affects the corresponding one of the light beams (par. [0096], lines 10-12).

Regarding claims 5 and 86, Kapellner discloses the system of claim 4, wherein the tophat element is configured to affect the intensity profile of the corresponding light beam to produce therefrom an illuminating light beam of the substantially rectangular intensity profile corresponding to a geometry of the entire surface to be illuminated (par. [0108], lines 8-10).

Regarding claim 8, Kapellner discloses the system of claim 1, wherein said light source system comprises a plurality of light source elements each producing the corresponding one of said light beams (par. [0096], lines 1-3).

Regarding claim 10, Kapellner discloses the system of claim 1, comprising a focusing optics comprising a lens accommodated in optical paths of an array of the light beams to direct them along an optical axis of the lens (par. [0096], lines 17-18).

Regarding claim 11, Kapellner discloses the system of claim 1, comprising a focusing optics comprising an array of lenses each in an optical path of the corresponding one of an array of the light beams (par. [0103], lines 7-8).

Regarding claim 17, Kapellner discloses the system of claim 1, wherein said light

source system comprises at least one light source element, said light source element being at least one of the following: light emitting diode (LED), laser die, Edge Emitting Laser, Surface Emitting Laser (par. [0096], lines 1-2).

Regarding claim 35, Kapellner discloses the system of claim 1, wherein said light source system is configured to define at least two spatially separated optical paths (shown in fig. 9), the light source system (902) comprising at least two light sources operating in different wavelength ranges (par. [0096], lines 1-2).

Regarding claim 36, Kapellner discloses the system of claim 35, wherein at least one of said light sources comprises a pumping light source arrangement and a non-linear optical medium (par. [0107], lines 2-3).

Regarding claim 37, Kapellner discloses the system of claim 35, wherein the beam shaping arrangement comprises a tophat element (914A-914C) assembly accommodated in one of the optical paths to allow passage of the spatially separated light beams therethrough and thereby produce output light beams of the substantially rectangular uniform intensity profile (par. [0108], lines 9-10); and a light combining unit for combining light from said at least two optical paths to propagate along a common optical path (par. [0097], lines 1-4).

Regarding claim 38, Kapellner discloses the system of claim 37, comprising a Spatial Light Modulator (SLM) accommodated in said common optical path (par. [0095], line 2).

Regarding claim 39, Kapellner discloses the system of claim 38, wherein the spatially separated light beams are arranged in a predetermined array corresponding to

a pixel array arrangement of the SLM (par. [0095], lines 5-6).

Regarding claim 40, Kapellner discloses the system of claim 38, wherein the tophat element assembly comprises an array of tophat elements (914A-914C) each associated with a corresponding one of the light beams (902A-902C) .

Regarding claim 43, Kapellner discloses the system of claim 36, wherein said at least one pumping light source arrangement comprises a certain number of Surface Emitting Lasers (par. [0107, line 2], and said at least one other light source comprises a certain number of laser dies (par. [0107], line 7).

Regarding claim 47, Kapellner discloses the system of claim 35, comprising at least two focusing optics (1216) arrangement accommodated in said at least two optical paths (par. [0103], lines 7-8).

Regarding claim 65, Kapellner discloses an optical system configured to provide a desired illuminating light pattern, the system comprising a light source system (902) configured and operable to produce structured light in the form of a plurality of spatially separated light beams (902A-902C); and a beam shaping arrangement (914A-914C) comprising; the beam shaping arrangement being configured as a diffractive optical unit (par. [0096], line 11) configured and operable to combine an array of the spatially separated light beams into a single light beam thereby significantly increasing intensity of the illuminating light (fig. 9, par. [0097], lines 2-3).

Regarding claim 67, Kapellner discloses the system of claim 65, wherein said diffractive optical unit is configured to affect the intensity profile of the beam to produce therefrom a light beam of a substantially rectangular uniform intensity profile (par.

[0108], lines 9-10).

Regarding claim 68, Kapellner discloses the system of claim 67, wherein said diffractive optical unit comprises a tophat element assembly (par. [0096], line 11).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi (4701005) hereafter Noguchi in view of Kapellener et al. (20060279662) hereafter Kapellener.

Regarding claim 3, Noguchi discloses as set forth above but does not specifically disclose wherein the diffractive optical unit comprises a tophat element assembly. Kapellner teaches that in optical system that it is desirable to have a tophat element assembly (par. [0108], lines 1-5) for the purpose of converting a Gaussian beam shape into a rectangular unified beam. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have the diffractive optical unit of Noguchi as modified by Kapellner included a tophat element assembly since Kapellner teaches that in optical system that it is desirable to have a tophat element assembly for the purpose of converting a Gaussian beam shape into a rectangular unified beam.

Allowable Subject Matter

11. Claims 2, 6, 7, 9, 12-16, 18-34, 41, 42, 44-46, 48-64, 66-70, 83, 87, and 88 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. Claim 71 is allowed.

13. The following is a statement of reasons for the indication of allowable subject matter: with respect to the allowable claims, the prior art does not disclose the combination of limitations to warrant a rejection under 35 USC 102 or 103.

Regarding claim 2, the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "wherein said diffractive optical unit comprises at least one inverse Dammann grating".

Regarding claim 6, the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "wherein the tophat element is configured to affect the intensity profile of the corresponding light beam to produce therefrom an illuminating light beam of the substantially rectangular intensity profile corresponding to a geometry of a single pixel from an array of pixels in a surface to be illuminated".

Regarding claim 7, the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "wherein the tophat element is configured to affect the intensity

profile of the corresponding light beam to produce therefrom an illuminating light beam of the substantially rectangular intensity profile corresponding to a geometry of a sub-array from an array of pixels in a surface to be illuminated".

Regarding claim 9 (and its dependents), the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "wherein said light source system comprises at least one light source element generating at least one light beam; and a light splitting unit for splitting the at least one light beam into an array of the spatially separated light beams".

Regarding claim 12 (and its dependents), the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "wherein said light source system comprises at least one pumping light source arrangement and at least one non-linear optical medium to be pumped by light generated by said at least one pumping light source arrangement".

Regarding claim 29 (and its dependents), the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "control unit associated with the light source system, said control unit being preprogrammed to carry out a sequencing mechanism to thereby sequentially actuate a plurality of light source elements in accordance with a predetermined pattern".

Regarding claim 41 (and its dependents) the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "wherein the beam shaping arrangement comprising at least one light splitting unit accommodated at the output of said at least one non-linear optical medium, respectively, and configured for splitting light emerging from the non-linear optical medium into a predetermined array of the spatially separated light beams for propagating along the respective at least one optical path; and comprising at least one tophat element assembly accommodated in at least one of said optical paths to allow passage of the spatially separated light beams therethrough and thereby produce output light beams of a substantially rectangular uniform intensity profile; and a light combining unit for combining light from said at least two optical paths to propagate along a common optical path".

Regarding claim 44 (and its dependents), the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "wherein the light source system comprises first and second Surface Emitting Laser arrays producing light of different wavelengths, respectively, and operating as first and second pumping sources for the first and second non-linear optical media; and comprises the laser die array operating with a third different wavelength".

Regarding claim 49 (and its dependents), the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "wherein the light source system is

configured to define three spatially separated optical paths associated, respectively, with the first light source including an array of Surface Emitting Lasers and producing an array of spatially separated light beams; the second light source including a light emitting diode (LED); and the third light source formed by an array of laser dies".

Regarding claim 58 (and its dependents), the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "at least one multi-pixel diffractive optical phase mask configured to produce said structure light in the form of a predetermined pattern of spatially separated light beams".

Regarding claim 66 (and its dependents), the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "wherein the diffractive optical unit comprises an inverse Dammann grating assembly".

Regarding independent claim 71, the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "the beam shaping arrangement comprising an inverse Dammann grating assembly configured and operable to combine said plurality thereby significantly increasing intensity of the illuminating light".

Regarding claim 83, the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "passing the multiple light beams through an inverse Dammann grating".

Regarding claim 87, the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "wherein the tophat element is configured to affect the intensity profile of the corresponding light beam to produce therefrom the illuminating light beam of the substantially rectangular intensity profile corresponding to a geometry of a single pixel from an array of pixels in a surface to be illuminated".

Regarding claim 88, the prior art does not disclose the claimed optical system specifically including, as the distinguishing features in combination with the other limitations the claimed "wherein the tophat element is configured to affect the intensity profile of the corresponding light beam to produce therefrom the illuminating light beam of the substantially rectangular intensity profile corresponding to a geometry of a sub-array from an array of pixels in a surface to be illuminated".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES C. JONES whose telephone number is (571)270-1278. The examiner can normally be reached on Monday thru Friday, 8 a.m. to 5 p.m. est. time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on (571) 272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James C. Jones/
Examiner, Art Unit 2873
7/30/2010

/Ricky L. Mack/
Supervisory Patent Examiner, Art Unit 2873